

WHAT IS CLAIMED IS:

- 1 1. A moving body detecting apparatus comprising:
2 image acquiring means for acquiring static images continuing in time
3 sequence in the same monitoring range; and
4 decision processing means for receiving a plurality of static images
5 continuing in time sequence from said image acquiring means to make a
6 comparison among said static images for making a decision as to whether or not a
7 body moves from an area allowing the existence of a body (which will hereinafter
8 be referred to as an "allowable area"), set in advance in said monitoring range, to
9 an area inhibiting the existence of a body (which will hereinafter be referred to as
10 an "unallowable area"), set in advance in said monitoring range.
- 1 2. The apparatus according to claim 1, wherein each of said allowable area
2 and said unallowable area are set in the form of a point set.
- 1 3. The apparatus according to claim 1, wherein each of said allowable area
2 and said unallowable area are prescribed by a boundary line of its outer
3 circumference.
- 1 4. The apparatus according to claim 1, wherein said decision processing
2 means calculates an absolute value of a difference in luminance value between
3 each of said plurality of static images from said image acquiring means and a
4 background image stored in advance for each pixel to produce a plurality of
5 difference images, and makes a comparison between said difference images to
6 make a decision as to whether a body moving from said allowable area to said
7 unallowable area exists or not.
- 1 5. The apparatus according to claim 4, further comprising preliminary
2 decision processing means for making a comparison with respect to said

3 allowable area between said background image stored in advance and said static
4 image from said image acquiring means to make a preliminary decision as to
5 whether or not a difference therebetween exceeds a predetermined value so that
6 said decision processing means carries out the decision processing only when a
7 preliminary decision result in said preliminary decision processing means shows a
8 difference exceeding said predetermined value.

1 6. The apparatus according to claim 4, wherein said decision processing
2 means converts said difference images into binary image data and labels them so
3 that, on the basis of information on an area and position of a pixel set obtained
4 through the conversion and labeling, a decision is made as to whether a moving
5 body exists or not.

1 7. The apparatus according to claim 6, wherein, simultaneously with the
2 labeling, said decision processing means calculates the area of said pixel set
3 through the use of a counter.

1 8. The apparatus according to claim 1, wherein said decision processing
2 means includes motion vector calculating means for calculating, on the basis of
3 information on a position of a pixel set, a motion vector indicative of a motion of
4 said pixel set, and said decision processing means implements the decision
5 processing on the basis of the calculated motion vector.

1 9. The apparatus according to claim 1, further comprising notifying means
2 for notifying the existence of a moving body to a user so that said decision
3 processing means issues a command to said notifying means to notify the
4 existence of a moving body to said user when making a decision that said moving
5 body exists in said monitoring range.

1 10. The apparatus according to claim 1, further comprising warning means for
2 warning a moving body so that said decision processing means issues a command
3 to said warning means to warn a moving body when making a decision that said
4 moving body continuously exists in said monitoring range for a predetermined
5 period of time.

1 11. The apparatus according to claim 1, wherein said moving body detecting
2 apparatus is used as an antitheft apparatus.

1 12. The apparatus according to claim 1, wherein said decision processing
2 means receives static images from said image acquiring means to produce a
3 composite image by successively carrying out image composing on said static
4 images so that each pixel has the highest luminance value, and when the number
5 of static images used for the image composing reaches a predetermined value,
6 makes a decision as to whether or not a body moving exists in said composite
7 image.

1 13. The apparatus according to claim 12, wherein said decision processing
2 means receives static images from said image acquiring means to produce
3 difference images by calculate, with respect to each pixel, the absolute value of a
4 difference in luminance value between said static images from said image
5 acquiring means and a background image stored in advance for producing a
6 composite image by successively carrying out image composing on said
7 difference images so that each pixel has the highest absolute value, and when the
8 number of difference images used for the image composing reaches a
9 predetermined value, conducts decision processing as to whether or not a body
10 moving exists in said composite image.

- 1 14. The apparatus according to claim 12, wherein said decision processing
2 means conducts the decision processing repeatedly.
- 1 15. The apparatus according to claim 12, further comprising preliminary
2 decision processing means for making a comparison with respect to a
3 predetermined region between a background image stored in advance and said
4 static image from said image acquiring means to make a preliminary decision as
5 to whether or not a difference therebetween exceeds a predetermined value so that
6 said decision processing means carries out the decision processing only when a
7 preliminary decision result in said preliminary decision processing means shows a
8 difference exceeding said predetermined value.
- 1 16. The apparatus according to claim 12, wherein, when receiving said static
2 images from said image acquiring means, said decision processing means makes a
3 decision as to whether to select said static images, and continues the decision
4 processing only when selecting said static images.
- 1 17. The apparatus according to claim 12, wherein said decision processing
2 means converts said composite image into binary image data and labels them so
3 that, on the basis of information on an area and shape of a pixel set obtained
4 through the conversion and labeling, a decision is made as to whether a moving
5 body exists or not.
- 1 18. The apparatus according to claim 17, wherein, simultaneously with the
2 labeling, said decision processing means calculates the area of said pixel set
3 through the use of a counter.
- 1 19. The apparatus according to claim 12, further comprising notifying means
2 for notifying the existence of a moving body to a user so that said decision

3 processing means issues a command to said notifying means to notify the
4 existence of a moving body to said user when making a decision that said moving
5 body exists in a monitoring range.

1 20. The apparatus according to claim 8, wherein said motion vector
2 calculating means including:
3 an image pickup device made to take a photograph continuously;
4 image composing means for, on the basis of a plurality of input images
5 continuously by said image pickup device, acquiring, as each of representative
6 pixel values, a maximum value of pixels existing at the same positions in frames
7 of said input images to produce a composite image comprising said representative
8 pixel values; and
9 composite image processing means for extracting a motion vector
10 indicative of a displacement of a photographed body in said frames on the basis of
11 a trajectory of an image pickup point appearing in said composite image produced
12 by said image composing means.

1 21. The apparatus according to claim 20, wherein said image pickup device is
2 fixed in place, and a movement quantity of a moving body is obtained on the basis
3 of said motion vector extracted by said composite image processing means.